

THE EUGENICS REVIEW.

MENTAL DISEASE IN RELATION TO EUGENICS.

THE GALTON LECTURE.

BY A. F. TREDGOLD, M.D., F.R.S.Ed.

I have chosen as my theme for the Galton Lecture *Mental Disease in relation to Eugenics* for two reasons. In the first place, it seemed to me appropriate because of the particular interest which Galton always took in mental capacity and development, and the valuable researches which he made in these subjects. In evidence of this I may remind you of his important works "Hereditary Genius" published in 1869; "English men of Science, their nature and nurture," published in 1874; "Enquiries into Human Faculty and its Development," first published in 1883 and reprinted in 1911, together with many smaller essays in the same field.

Secondly, the subject of Mental Disease is one which, of itself, possesses a particular importance for Eugenists. It cannot be doubted that the evolutionary change which has taken place in man since his emergence from the anthropoid apes has been mainly, if not entirely, in the sphere of mind. This change consists in the development of his powers of understanding and comprehension, in the elaboration of his emotions and capacity to appreciate and be influenced by ideals, and in the expansion of his ability to think, to reason and to construct. No doubt this increased development of mind has rendered man more potent for evil as well as for good, but on the whole he has progressed, and he stands at the present day on a much higher plane than did his

primeval ancestors. If man is to undergo any further progressive evolution, I think it may safely be assumed that it will be in the same direction and will consist in a still greater development of his mental capacity. The important question is—Is such further progress possible? To this we can give no definite answer. When we consider, however, how stupendous must be the process which has led to man being evolved from that first primitive speck of protoplasm, and how silently and persistently it has been at work through immeasurable ages, it would seem unreasonable to think that it is now played out, and that it has reached its culmination with man as he now exists. On the contrary, I think we are justified in concluding that further evolution is certainly possible. But progressive evolution is dependent upon vitality and health. Ill-health and incapacity of mind will not merely prevent advance, they will inevitably lead to retrogression. Hence the importance of Mental Disease from the aspect of Eugenics.

In order to appreciate fully this importance of disease of mind it is necessary that we should understand its nature and causation, and it is with these points that I propose first to deal. In doing this I shall make no attempt to discuss the nature of mind and its relation to matter. In the present state of our knowledge any such discussion is futile. We do know, however, that in some way or other mind is made manifest through brain; that brain is, in fact, the organ of mind, and it is from this aspect that I shall consider the subject of its disease.

If we view the subject broadly, we may regard disease in general as the result of a failure of the organism to adapt itself to the inimical agencies of its environment. If this failure is slight and temporary, the departure from health is transient; if it is severe, a grave illness or disease results; if the failure is complete, the organism dies. In short, efficient adaptation is not only essential to health, but it is probably the basic characteristic and the distinguishing feature of life. Disease of mind is no exception to this general rule. The efficient adaptation and response of mind to the experiences and demands of the environment constitutes mental health. Failure of adaptation is the essential feature of mental ill-health and disease.

It is very necessary that we should distinguish between disease and eccentricity of mind. Many persons exist whose mode of thought and behaviour differ so much from the majority of mankind as to cause them to be regarded as queer and eccentric. But these are by no means inefficient or lacking in adaptation; on the contrary they are often pioneers in thought and valuable members of the community.

The failure of adaptation which is the essential feature of mental disease may be divided into three forms. In the first, failure is due to the fact that the mind has not developed up to the stage which is requisite for efficient adaptation to take place. There is a permanent and incurable deficit. This condition constitutes Mental Deficiency. In the second form, the failure of adaptation is due not to incomplete development, but to a disturbance of mental function. This disturbance may be slight and transient, or it may be profound and of long duration. It may involve minor mental functions only, or it may be so extensive as to upset the whole mental balance. In short, it ranges through various "borderland" conditions to Insanity. In the third

form, adaptation fails because mind is in process of deterioration and decay. This may, of course, be a consequence of old age and it is then merely physiological; but it very frequently occurs long before the average span of life has been reached, and it is then pathological. In one of the commonest forms of mental disease such decay sets in during the period of adolescence and it may even appear in the first decade of life. Deterioration of this kind is usually steadily progressive and it constitutes the various types of Dementia. I may remark that although it is convenient for purposes of description, thus to speak of *defect*, *disorder* and *decay* of mind, as if they were totally separate conditions, there is nevertheless a very close relationship between them. While it is true that mental disorder is often only temporary, and completely recovered from, yet in many cases recurrences occur, and in a considerable proportion such disorder is but the initial manifestation of an incurable mental decay. Even the subject of mental deficiency not infrequently suffers also from disorder and decay of such mental capacity as he possesses. I shall also hope to show that, with certain exceptions, all three forms are really but different manifestations of one and the same underlying cause.

With regard to the cause of mental disease there is not the slightest doubt that a proportion of cases are the result of adverse external agencies acting directly upon the individual. Thus, the development of the brain may be arrested by injury or disease and Mental Deficiency result. The normally developed brain may be damaged by poisons or inflammation and Insanity or Dementia supervene in consequence. A perfectly healthy individual may be subjected to such extreme mental stress as to cause mental derangement. Cases of this kind, however, comprise a relatively small proportion of the whole, and there is clear evidence that the great majority of persons suffering from defect, disease or decay of mind, owe their condition to an inherent predisposition. This predisposition may be so great as to produce its effect in the entire absence of any external factor; in other instances it is conjoined with such factors, which, however, are usually so trivial that they would have had no effect upon a normally constituted individual.

Thus, I estimate that about 4/5ths of all cases of Mental Deficiency are entirely due to inherent causes. It is generally agreed that the great majority of cases of Dementia Precox are the result of an inherent predisposition. With regard to Insanity and the various psychoses, external influences play a considerably larger part, but even here it is generally accepted that the main cause is constitutional rather than environmental. As is well known, a very large number of cases of mental disorder occurred during the recent war and were attributed to "shell shock." But the men so affected were exposed to no worse conditions than were thousands of others who suffered from no serious mental disturbance, and in very many cases so called "shell shock" occurred in men who had never left England and had never even seen a shell. The real cause of the breakdown was mental stress, and in most of the sufferers a definite predisposition to such breakdown was present.

In short, whilst recognising the contributory, and in some cases the directly causal, part played by the environment, I have no hesitation in saying that an overwhelming proportion of cases of mental

disease must be regarded as primarily due to innate and not to external causes.

But there is something more. When careful enquiries are made into the family histories of these persons it is found that in very many instances other members of the family have also suffered from some form of mental abnormality. That is to say, there is evidence of a *family* predisposition. The connecting link between the members of a family is, of course, the germ plasm, and hence it is justifiable to conclude that in such cases the predisposition is germinal and has been hereditarily transmitted. It follows that the majority of cases of mental disease are the result of inheritance.

At this point it is important to refer to a matter about which there is considerable misunderstanding. It is often assumed that when a condition is said to be due to inheritance it necessarily follows that it has existed in the same form in the ancestors, and that it will be transmitted in the same form to succeeding generations. Thus, in the particular instance of mental disease, it is assumed that the person who is mentally deficient must be the offspring of a mentally deficient parent, or the person who is insane the offspring of an insane parent. This is not the case. Speaking strictly, there is no such thing as the inheritance or transmission of mental defect, or insanity, or indeed of any quality as it actually exists in the individual. It is, of course, certain that every organ and tissue of the body is represented in the germ cells from which it is derived, but such representation is not in the form of the actual organs or tissues, but as "determinants" or "directive forces," and it is important to realize that what is inherited is a tendency for development to proceed in certain particular directions and up to a certain limit; in other words, a developmental potentiality.

Now there is reason to think that the developmental potentiality of the germ cells may, in certain circumstances, be considerably impaired. If such impairment is general and widespread, it is extremely probable that the embryo will die at an early stage of its career. In such cases the general devitalization does not permit of that degree of development which is necessary for the maintenance of independent life. If the impairment is localized to one "determinant" only, there will then be a tendency to imperfect development or defective durability of the corresponding organ or tissue. This localized impairment constitutes a diathesis and when it concerns the central nervous system it is termed the "neuropathic diathesis." The point I desire to emphasize is that in cases of mental disease the inheritance is not of the disease itself, but of this neuropathic diathesis. In other words, what is inherited is a diminished vitality and an impaired developmental potentiality of the neuronc determinant.

I think we have now arrived at a point at which it is possible to formulate a working hypothesis of the genesis of mental disease and a concept of the manner in which the three chief forms of this disease are linked to one another; what I suggest is the following:

First, the basis of most cases of mental disease is an inherited predisposition. This predisposition is the result of an impairment of the developmental potentiality of the neuronc determinant within the germ cell, which is caused by adverse factors of the environment.

In all probability these factors consist of toxins, which are either introduced into the body from without, or are developed within the body itself. These act either by directly poisoning the germ cells or by depriving them of some essential food constituent. In consequence of differing degrees of susceptibility of the germ cells and of differing degrees of potency of the factors to which they are exposed, the intensity of the impairment varies in different individuals and in different germ cells of the same individual. Although some advocates of Weismannism hold that the germ plasm is not only "continuous," but that it is proof against such influences, I am of the opinion that there is clear evidence that such an impairment does actually occur.

Secondly, the results of this impairment of the germ cell are influenced by the condition of the cell which it fertilizes or by which it is fertilized. This raises the question of the mode of hereditary transmission: namely, whether this is in accordance with Mendelian Laws or whether it is by blending. Numerous attempts have been made to show that mental disease, and particularly mental defect, is a Mendelian unit which is transmitted according to Mendelian Laws. In my opinion these attempts have completely failed, and I think the evidence is strongly against the impairment being a Mendelian unit and in favour of the condition of the zygote being a blending of the developmental potentiality of the two gametes. I think, therefore, that if there is a similar impairment of the combining cell the developmental potentiality of the embryo will be still further reduced, but that if this cell is healthy the developmental impairment will tend to be lessened.

Thirdly, since inheritance is of developmental tendencies only, the environment will play a part in their realization. Adverse factors of the environment which are in operation before the development of the brain is complete may still further embarrass development and accentuate the tendency to imperfection. Factors acting after the completion of development may render any latent defect of durability patent and may cause the mental breakdown of an individual in whom the predisposition is only slight and who might otherwise go through life apparently normal.

The view I put forward, therefore, is that (with the exception of those cases which are *directly* caused by the environment) the various forms of mental defect, disorder and decay, are manifestations of one and the same condition; namely, an impairment or devitalization of the germ cell. This impairment occurs in varying degrees; when severe, it causes brain development to be so incomplete that the individual is mentally deficient. When less pronounced, brain development may take place normally, and the temple of mind may be erected, but the structure is so lacking in durability that it at once begins to crumble away and Dementia Præcox results. When the germ impairment is of still less degree, mind is completely developed and may function normally for many years, indeed should the individual live in sheltered surroundings, it may do so for the whole span of life; but exposure to mental stress or physical illness, or the changes incident to the climacteric or other critical period of life, will be very prone to result in a breakdown, and this in many cases will be the beginning of a steadily progressive dementia.

As I have pointed out, however, two other factors have to be taken into account; namely, the condition of the second or combining germ cell, and the nature of the environment, especially during the early and rapid stage of brain growth. If the second cell is healthy and the early surroundings entirely favourable, I think that a slight degree of impairment may be entirely neutralized, it may even be "bred out." On the other hand, if the second gamete is similarly impaired, there will be an accentuation of the process and a tendency for the developmental potentiality and durability of the brain cells to be still further lessened. This may itself give rise to mental defect, or defective development may result from the operation of some comparatively trivial environmental factor.

It is clear that combinations of these three factors, namely, variations in the degree of germ impairment, the condition of the combining cell, and the nature of the environment, will be responsible for very varying results in different individuals derived from the same stock or belonging to the same family. It is well known that these differences occur and they are a cause of much perplexity; but I think they are explicable on this view. It not infrequently happens that an individual who has inherited the neuropathic diathesis mates with one who is similarly tainted. There is then a predisposition for the mental impairment to assume a more severe form in the next generation, or to occur at an early period of life, a process which is called "antedating," and which has long been known to mental specialists. The final result of this process is pronounced mental defect with sterility and extinction, and hence I have termed Idiocy the logical culmination of the neuropathic diathesis. In other instances a victim of the neuropathic diathesis mates with an individual who is healthy. Their offspring, although carrying the taint, and probably showing some impairment of mental capacity and resistance, may not actually suffer from mental disease. But the fire is only smouldering and should one of these in turn mate with a neuropath, or should he or his offspring be exposed to some adverse environmental influence, it may readily be fanned into a flame, and Dementia, Insanity or Mental Defect result. In this way mental disease is kept alive by "carriers," who may themselves appear to be normal, or who at all events do not suffer from a degree of abnormality which would be recognized as disease.

In giving this short outline of the genesis and mode of production of Mental Disease I wish to make it clear that I am only advancing a working hypothesis. The complexity of the subject is great and there are many gaps in our knowledge, but I venture to think that the hypothesis is a logical one and that it does afford an explanation of facts which are otherwise extremely perplexing.

We have now to consider the bearings of Mental Disease upon Eugenics. At the outset it is necessary to allude to a prevalent misconception regarding the relationship of mental disease to Genius. Since Dryden proclaimed that

"Great wits to madness nearly are allied,
And thin partitions do their bounds divide,"

it seems to have been commonly assumed that Genius is so intimately connected with Insanity that we must cheerfully put up with the latter for the sake of the former, and that any attempt to diminish mental disease by restriction of propagation may have the disastrous result of robbing the world of a possible superman. Now I fully admit, of course, the great benefits which have resulted to mankind from the works of men of genius; it is, indeed, to the existence of such men of outstanding ability in the various departments of human knowledge, thought, feeling and action, that we largely owe our past progress and our present civilization. There is also no doubt that some of these men have been of poor physical constitution and prone to ill-health, whilst others have been eccentric and possessed of delicately balanced minds. But I have searched in vain for any close correlation between genius and insanity, and I believe the commonly accepted view that such exists to be a completely mistaken one. On the contrary I think it will be found that the great majority of men and women of outstanding ability have been particularly sane, and have come of sane and healthy stock. It is, therefore, an utter fallacy to assume that the elimination of mental disease would mean the elimination of genius, and I am in complete agreement with the views on this point expressed by Major Darwin in his valuable work on "Eugenic Reform."

On the other hand, there is clear evidence that mental disease is closely correlated with social incapacity, inefficiency and retrogression. To appreciate this we have only to consider the number of mentally affected persons, their cost to the community, and the influence they exert upon the race. With regard to number it is impossible to give any precise figures for the reason that very many cases exist which are not notified. The special enquiries made by the Royal Commission of 1904 showed that there were four Mental Defectives per thousand of the total population, equivalent at the present time to approximately 174,000 persons in England and Wales. In addition to these, the Report of the Board of Control shows that on 1st January, 1926, there were 133,883 persons under care suffering from Insanity. There is not the slightest doubt, however, that both these figures understate the real incidence of these conditions, and I think we shall be well within the mark in saying that the total number of persons suffering from certifiable mental disease in England and Wales at the present time is over 1 per cent. and perhaps nearer 2 per cent. of the general population. These figures, however, refer to certifiable cases only. In addition, it is probable that there is an even larger number of persons who are not certifiable, but whose efficiency is more or less seriously interfered with by such conditions as Neurasthenia, Hysteria, Epilepsy, Mental Instability and states bordering upon Insanity and Mental Defect. A propos of this it may be stated that according to a recent report of the Board of Education there are no less than 600,000 mentally backward children in the country, and with regard to these the chief medical officer says, "This group is unable to respond with proper benefit to our educational system, and adds 50,000 recruits to our industrial army every year who are not only unprepared, by mental retardation, to meet effectually the demands of full life, but who furnish society

with the bulk of its inefficient adults—criminals, paupers, mendicants and unemployables.”

Unfortunately, although we have National statistics regarding the mortality rates, we have none showing the incidence of disease which is not fatal, and no adequate data regarding the health of the Nation. This is a very serious defect and, in consequence, it is impossible to say what is the total number of persons in the country suffering from disease or abnormality of mind, or whether such conditions are increasing or diminishing. It is quite clear, however, that the number must be very great and I think there is no doubt that disease of mind is far more prevalent than is disease of any other portion of the body.

With regard to the total cost of mental disease to the Nation, it is for the same reason quite impossible to give even an approximate estimate. When we consider, however, how important, indeed vital, is the part played by mind in the business of life; what a serious effect upon efficiency is exerted by even a slight degree of impairment; how frequently mental disease and disorder are due to constitutional tendencies, and consequently are either persistent, are of long duration, or are prone to recur; it is clear that the loss which results from the lessened productiveness, together with the cost of maintenance, care and treatment of affected persons, must combine to cause an enormous drain upon the resources of the nation.

But, serious as is the damage done by mental disease to the present generation, I believe that inflicted upon the race to be even greater. It is fallacious to assume that we can put out of court any possibility of racial impairment because there is now no proof of an increase in certifiable mental disease. On the contrary, if we take a long view, it might even be argued that an increase in intensity, owing to a concentration of the process amongst fewer individuals, would be beneficial and that, under certain conditions, the danger to the race would be greater with a diminution of the more pronounced forms of mental disease. This appears paradoxical, but the conditions I have in mind are these. As I have previously pointed out, mental deficiency, the early dementias, and the chronic and incurable forms of insanity are in many instances the result of an accentuation of germ impairment consequent on the mating of like with like. The tendency of such mating is eventually towards sterility and, although the process would be attended with enormous cost, it is quite possible, if the mating of neuropaths were rigidly restricted to those similarly affected, that the disease would eventually work out its own elimination. It seems not improbable that this is what has actually happened in the case of certain maladies of the body to which the nation has long been exposed, such for example as Tuberculosis, and that their decline may really be due to the gradual eradication of the susceptible rather than to preventive medicine. However this may be; I am disposed to think that the gradual dissemination of the neuropathic diathesis throughout the community, consequent on the mating of the affected with those who are healthy, may really be more costly in the end, inasmuch as it may lead to degeneracy of the nation and the race.

It is sometimes stated that no families are free from the neuro-

pathic taint. This, however, is not so. While it may be true that a case of mental breakdown exists in many genealogical trees, it does not follow that this is the result of an inherited tendency, and I believe that there are many families in the country which are sound and healthy and which are capable of producing sound and healthy successors. The danger to the race lies in the contamination of these stocks by those who are predisposed to mental disease. Under such circumstances it is true that the predisposition may be lessened, and the neuropathic diathesis so diluted that it no longer manifests itself as certifiable lunacy or deficiency; but the nervous stamina and vigour of the offspring are lowered, there is a lessening of adaptiveness and capacity for effort, and an increased proneness to mental instability, defective control and inefficiency. In other words, the nation gradually becomes more neurotic; mental evolution is brought to a standstill, and there sets in that process of marking time which is only too often the forerunner of retrogression. Although I am far from thinking that our nation, as a whole, is degenerate, yet signs are not wanting that such a deterioration of nervous stamina is gradually diffusing itself throughout the community; and if this process is allowed to continue it must inevitably end in degeneracy.

It was for the purpose of averting this calamity and furthering progressive evolution that this Society was founded, and we may briefly consider the ways and means by which these 'ends' can be achieved. There can be no question that one thing which is urgently needed is the prevention of the propagation of those persons who suffer from any form of mental disease due to inheritance. For instance, if the Nation wishes to have a sane and capable posterity, the insane and mentally defective should certainly not be allowed to procreate. But there is no law to prevent any person with a marked predisposition to insanity from marrying; there is no law to forbid him or her producing more children when discharged from an asylum during a period of remission; there is even no law to prevent the marriage of a mental defective, although such person is by legal definition incapable of managing himself or his affairs, and is in need of care, supervision and control.

In the case of mental defectives, two methods for preventing propagation have been suggested; namely, sterilization and segregation. This is not the place to discuss in detail their respective merits. I will merely say that after careful consideration of all the points involved, such for instance as practicability, cost, the happiness of the defectives, and the effect upon the community of the release from care of persons who are incapable of caring for themselves, I have come to the conclusion that the advantages of segregation far outweigh those of sterilization. In saying this I realize that there are many persons suffering from the milder grades of mental defect who are not themselves in need of institutional care, and in whose case the chief danger is propagation. Even here I consider that there are abundant reasons against sterilization, and I believe that if ascertainment were only properly carried out, so that the whereabouts of each person were known; if every person not in an institution were placed under statutory supervision and the methods of such supervision improved, so that he

could be removed to an institution should circumstances arise to make this desirable; and if the marriage of mental defectives were made illegal, the risk of propagation would become practically negligible.

It is necessary to point out, however, that even if, by sterilization or segregation or supervision, we could absolutely prevent propagation by defectives, we should by no means eliminate mental defect or disease; indeed it is very doubtful if we should produce any considerable effect at all. For, in spite of the fact that approximately 80% of such cases are due to inheritance, the proportion who are the offspring of a mentally defective parent is a very small one. The great majority of defectives are produced by parents who have either been insane, or have been carriers and have not been certifiable at all. The sterilization or segregation of every defective would merely prevent the birth of that relatively small number who are the offspring of parents who are themselves defective. I think that if it were possible to apply either of these methods to the insane the effect would be considerably greater, for propagation by the insane is much more extensive than by defectives; but even then we should be a long way from the eradication of mental disease. In order to produce any really marked diminution in the amount of mental disease throughout the community it would be necessary to sterilize or segregate every carrier of the neuropathic diathesis, which is obviously impossible.

But were it even possible to do this, we should be faced with another difficulty. There is every reason to think that the causes of germ impairment are still at work, and, this being so, a fresh crop of persons suffering from the neuropathic diathesis would soon come into existence. Although we have succeeded in removing some of these causes, and are in process of removing others, it seems likely that every change in social conditions and every advance in Evolution brings in its train inimical agencies which may impair the germ cells of those individuals who are unfit to continue the march. I have little doubt that for many generations to come devitalization of the germ cells and the neuropathic diathesis will continue to be produced. It is possible that this process may even be a salutary one, and that if only such affected persons could be prevented from contaminating the healthy, it might, in the long run and from the racial point of view, be productive of good rather than harm. Unfortunately nothing is done to prevent such contamination, and there is a very real danger of the dragging of sound stocks into the vortex of disease and of the diffusion of the impairment throughout the mass of the community.

It is probable that if Society were so constituted that the burden of any inefficient and defective offspring fell entirely upon the shoulders of those producing them, this would act as a decided deterrent. It would cause much greater attention to be paid to the health of a prospective partner and would certainly tend to diminish the production of defective and diseased children. But Society is very far from being constituted on these lines. There is no question that present conditions and the whole trend of social legislation, instead of acting as a deterrent to the production of the unfit, distinctly tend to limit the production of the fit. It has been suggested that the State should provide an antidote to this process and should devise some means,

such as by scholarships or relief from taxation, whereby the production of healthy and capable children would be encouraged. But it seems probable that the cost of this would ultimately fall upon the fit themselves, so that it is doubtful whether it could be applied on a sufficiently extensive scale to be productive of much real good. We have seen that, although it is possible by legislation to check the propagation of the mentally defective, and this should certainly be done, it is impracticable to do so in the case of many other forms of mental disease, and it is impossible to do so in the case of persons who may convey the taint, but who are not themselves affected. What then is to be done?

My own feeling is that there is one way, and one way only, by which we can hope to stem degeneracy and advance racial progress. That way is by an educational campaign whereby the whole community shall be enlightened as to the part played by inheritance in the causation of health and disease; in other words, by developing throughout the nation the Eugenic ideal. By the Eugenic ideal I mean not merely the intellectual recognition of the desirability of producing sound and healthy offspring, but a feeling, or an emotion, regarding this idea; a sense of shame and repugnance at the thought of bringing into the world delicate and defective children; a sense of satisfaction, of increased self-respect, and of duty well done at the thought of producing children who are healthy and capable. This may sound unpractical, perhaps to some persons even fantastic, but I do not think it is either. In terms of Psychology such an ideal constitutes a sentiment and the human mind has a great capacity for acquiring sentiments. It has already developed the religious and the aesthetic sentiments to a very high degree, and, just as all moral and cultured persons now feel deep repugnance at the idea of committing a crime, or when confronted with a disharmony in music, colour, form, or social decency, so I believe it to be equally possible for them to develop the Eugenic sentiment, or if we prefer so to call it, conscience.

No doubt our knowledge is far from complete, but there is quite enough to go upon, and I think the Education of the Nation should be the main objective of this society. It is impossible to conceive of any more important task or of one which would be attended with greater benefit. For it does not admit of any question that in the last resort the very existence of a Nation must depend upon the condition of its citizens, and it is extraordinary that a people which prides itself upon its sound common sense and business capacity should be content to spend millions upon the cure, care and maintenance of persons suffering from disease, and take practically no steps to prevent it at its source.